

steamship route north about Scotland. On the date named the British steamship *Lucerna*, Tyne to Philadelphia, latitude $58^{\circ} 30'$ north, longitude $14^{\circ} 30'$ west, reported a barometric reading of 28.09 inches, attended by a hurricane from the west and terrific seas. On the 19th and 20th these westerly gales swept the coast of Ireland and extended over the United Kingdom. Pressure over the Azores gave way February 22, and remained below the average until February 27. Thruout this interval, as usual, a well-marked anticyclonic area covered the British Isles, extending westward to the mid-Atlantic. Pressure over the American coast was high February 23 and 24, which, coupled with the low to the eastward, occasioned fresh north and north-northeasterly gales along the New York-West

Indian route. On the 25th a decided diminution occurred, the barometer at Quebec falling from 30.72 inches to 29.66 inches in twenty-four hours. The winds over the ocean to the westward of 60° underwent a corresponding shift from north and northeast to south and southwest. The center of the low moved rapidly eastward, and on the 26th westerly gales covered the transatlantic routes from Sable Island to 45° west, extending as far southward as the thirty-fifth parallel. The system then moved northward, and these gales were not felt east of the thirty-fifth meridian. February 28 showed a resumption of anticyclonic conditions over the American coast, with resulting strong northwesterly winds thruout the region to the southward of Newfoundland.

SPECIAL ARTICLES, NOTES, AND EXTRACTS.

NOTES OF A METEOROLOGIST IN EUROPE.

By H. J. COX, Professor of Meteorology. Dated Chicago, Ill., March 22, 1907.

An account of my trip abroad, in which I visited several of the meteorological offices in Europe, may be interesting to readers of the REVIEW, and, at the request of the Editor, I have prepared a summary. I have also included in the report my impressions of the weather experienced on the trip.

Whether traveling on business or pleasure, a "weather man" finds it difficult to entirely separate himself from his profession, and so it was with me on my voyage across the Atlantic. While on the ocean, I followed the readings of the barometer from day to day, noted the condition of the weather, the effect of the wind upon the sea, and indirectly upon the large ship on which I was sailing.

It had been my impression that on an eastward voyage storms were less likely than when bound westward; and that, if one left the American side in a period of fair weather, he was likely to have settled conditions all the way across; assuming, of course, that the storms move across the ocean with the same general direction and velocity as the ship. Yet during my passage of seven days storms occurred in rapid succession. The ship left New York on the morning of December 1, 1906, with partly cloudy weather and nearly normal barometer prevailing. During the next forty-eight hours the barometer fell steadily, reaching a minimum of 29.53 inches on the morning of December 3. High winds and rain prevailed on both the 2d and 3d, the rain on the 3d turning to snowsqualls, with winds shifting from southerly to northwest and followed by rising barometer and fair weather in the afternoon. The ship's weather report noted the conditions as "fresh gale and tempestuous sea". December 4 was again showery, with increasing winds from the east, and falling barometer. The ship's report again noted the conditions as "fresh gale and tempestuous sea". December 5 was showery with rising barometer and high northwest winds. The ship's report stated "moderate gale, rough sea". The barometer rose rapidly during the night of the 5-6th, reaching a maximum of 30.5 inches. Fresh southeast winds prevailed with cloudy weather and smooth sea during December 6. On the following day, December 7, the barometer, altho high, began to fall and showers prevailed. It became clear in the evening, however, and Daunt Rock Light, on the southwest coast of Ireland, was plainly visible late at night, the first indication of approaching land. When we reached the Cove of Cork, Queenstown Harbor, at 3 o'clock in the morning of December 8, and lay to for an hour in order to land some passengers and mail, it was dark and gloomy, and the faint outlines of the shores of Ireland, about half a mile distant, could barely be discerned. Later in the day during our passage northeastward to Liverpool thru St. Georges Channel and the Irish Sea, variable winds prevailed, and a partly overcast sky. The shore of Ireland could at no time be seen very clearly, but the mountains of Wales in the afternoon loomed up with great distinctness

on the right. It was dark when we reached the Mersey, and raining hard by the time the train for London pulled out of the Liverpool station at 8 p. m., but on my arrival in London at midnight the sky was entirely clear. A pleasant surprise awaited me in the shape of good weather in London during a stay of three and one-half days. The first two days were clear and cold with a minimum temperature below the freezing point; while on the third day—December 11—there was increasing haze, smoke, and fog, and by the afternoon the atmosphere was quite thick, objects being distinguishable but a short distance. It was, in fact, the well-known London fog, but in very weak form. Londoners told me it was "a mere nothing" as compared with what they often have. I was naturally interested in this condition, and desired to draw some comparison between it and the smoky weather which often prevails in Chicago, but there did not seem to be much similarity between the conditions. The atmosphere had a peculiar yellowish color, the haze or fog being apparently quite general, and it was so dense at 3 p. m., when I stood on London Bridge, that I could not see the Tower, about 600 feet distant. On the night of December 11 heavy rain set in, but by the following morning it was quite clear again.

I had a very pleasant visit to the meteorological office on Victoria street on December 10, meeting Dr. W. N. Shaw, the director, and several members of his scientific staff. The observatory in London is in St. James Park, there being no meteorological station at the central bureau. I learned from Doctor Shaw that the service is not considered distinctly governmental, as it receives its support by what is called the *Grant in Aid*. It is true, however, that it has no other funds at its disposal, except a few hundred pounds per year which it receives from the sale of the forecasts and weather maps. The price of the telegraphic forecast is one shilling and the cost of transmission. The price of the weather map is one pound per annum or one penny per day. Public and educational institutions are provided with these free of expense, as well as the newspapers, but the latter are required to send by messenger for the forecasts each morning, and the forecasts are not telephoned to anyone. The night forecast is published in the morning papers for the ensuing day. The meteorological service of Great Britain is not able to secure precedence of its messages over the telegraph wires, the post-office department refusing to recognize it as other than a private service. In fact, the director states that if a message containing a bet on a horse race were filed at the same time or even a little later than a storm-warning message the former would be likely to be sent first. This want of recognition hampers the service considerably, but the British boast that they are exceedingly democratic, and they feel that no precedence should be granted by the government telegraph lines except to messages solely concerning the affairs of state.

The observations are taken at 8 a. m., Greenwich time, in the British Isles and in France, and at 7 a. m. in other conti-

mental countries. They are received by special message in London in the forecast room, there being no working circuits such as we have in this country. The reports arrive very slowly, and those from eastern Europe and Spain are usually very late, sometimes not being received until the following day. There is also delay in translating from the centigrade and metric systems into Fahrenheit and English measures, as the scale on the continent is different from that used in England. The forecasts are issued about 10 a. m. Additional observations are taken at 2 p. m. in the British Isles, while 7 p. m. observations are taken generally all over Europe, but they are not telegraphed until the following day with the morning observations, being at hand for the use of the forecaster, in the shape of a supplementary map to his regular working morning chart. On the latter chart are entered practically all the current conditions, there being no additional charts of pressure and temperature, as are used in the United States.

There are four publications issued each morning: (1) Daily weather report, corresponding to our tabulated bulletin, showing the weather at various stations of Europe in tabulated form; (2) remarks on the weather, corresponding to our synopses; (3) general inferences, from the 8 a. m. observations, and the forecasts for the twenty-four hours ending the following noon for the various districts in the British Isles, corresponding to our general forecasts and forecasts for States; and (4) a four-page publication, including in its first page the "general situation" at 8 a. m. and the forecasts, duplicating Nos. (2) and (3) above; on the second page three tabulated bulletins, giving miscellaneous data thruout Europe and northern Africa for the previous day; on the third page, the daily weather report included in No. (1); and on the fourth page, five charts, the first being barometer, wind, and sea; the second, temperature and weather, both of the current day; the third, barometer and wind for the previous morning; the fourth, sunshine data for the year; and the fifth, temperature data for the month. Weather maps and forecasts are not issued from any other station in the British Isles. The total appropriation is about £35,000 sterling. Outside of a few stations, the observers in Great Britain are not paid, the stations being mostly maintained by universities and municipalities, and later I found that this custom prevailed largely on the Continent of Europe.

The reports of local observations in London are based upon readings made in St. James Park, the place previously referred to. Thru lack of time I was not able to visit the observatory in London, choosing instead to go to Kew, the visit to which is referred to later. I inquired, however, regarding the equipment in St. James Park and learned that it included a set of maximum and minimum thermometers exposed over the sod "in the open". I have always been much impressed with the publication of minimum and maximum temperature readings thus exposed, the minimum, of course, being of special interest in the winter and the maximum in summer. The latter reading indicates approximately the degree of heat that a person feels when exposed to the sun, and it is a matter of general interest, even tho the observation is not necessarily entirely correct. Even the dispatches which are sent during the heated spells from London to America usually include the so-called "sun temperature" as well as the "shade temperature". On December 10 the minimum temperature at London in the shelter was 31°, it being the coldest day since January 1, 1906. The minimum temperature exposed on the grass recorded 19°. In the language of the Daily Mail, the thermometer recorded "1° of frost" and "13° of frost", respectively.

The officials at the British Meteorological Office gave me a most cordial reception, and seemed pleased to learn all about the practical side of the American meteorological service. While my visit was mainly for the purpose of securing informa-

tion, Doctor Shaw and his assistants seemed equally desirous of learning what I had to say. Of course, they knew much about our service and accorded it the highest praise. It so happened that arrangements had just been made at the time of my visit to secure a telegraphic weather report from Iceland each morning, and it was on December 9, I believe, that the daily transfer of this report to Washington was begun by Doctor Shaw.

My visit to Kew Observatory on December 11 will long be remembered. I went out from Trafalgar Square by the "underground" to Kew Bridge; thence taking a tram to Richmond, passing en route by the Kew Botanical Gardens. It is necessary to walk some distance from the electric road thru the Mid-Surrey Golf Club grounds in order to reach the observatory, the entire distance from London being about nine miles. Its proper designation is the Kew Physical Laboratory. It is situated in a three-story frame building facing the north in the midst of Old Richmond Park. Obelisks located on the north and south sides of the building indicate the true north and south points. It was built by George III for the observation of the transit of Venus in 1769, and was then called the "King's Observatory." In 1842 it was handed over to the British Association, and in 1871 it was transferred to the Royal Society; it depends for its support upon contributions received from the latter society and the British meteorological service, and upon the fees received for the comparison of instruments and glasses. It is the oldest meteorological observatory in Great Britain; and while it is chiefly known to Americans as a meteorological observatory, and especially for the testing of thermometers and barometers, this is only a small part of its work. The greater portion of the staff is engaged in testing various other kinds of scientific instruments, such as telescopes, binoculars, and sextants. The testing, however, of electrometers, thermometers, and barometers is carried on as heretofore. Instruments tested at Kew have been sent out over the entire world. A meteorological station is, of course, maintained at the observatory, but its reports are not telegraphed to the British Meteorological Office, its proximity to London not justifying the expense. Kew has supervision, however, of the inspection of the meteorological stations in the British Isles, sending its men, when necessary, to visit the stations and properly care for the instrumental equipments. It is chiefly on this account that it receives a considerable portion of its financial support from the Meteorological Bureau.

The instrumental equipment at Kew is quite complete, and I was much impressed with the work of the Dines pressure tube anemometer, the record being highly satisfactory and indicating the force of every gust of wind. Such an instrument has been in use at the Central Office at Washington, I have been informed, but on account of recent changes it is temporarily out of service. A photographically recording wet and dry-bulb psychrometer affords a continuous record of relative humidity. If it were equipped with a fanning apparatus for facilitating evaporation it would be more effective. The bulbs of the thermometers are located in a shelter outside of, but attached to the building, while the record sheet is immediately inside. The electrometer at Kew is the oldest in the world and is the father of all instruments of that character, it, of course, being the standard. The Robinson anemometers in use at Kew and at other places that I visited in Europe were at least twice as large as the anemometers used in America. Exposed in the ground outside are two soil thermometers at depths of 1 and 6 feet, respectively, inclosed in an iron tube, the thermometers having been in the same position, I understand, for a period of nearly half a century. The rain gages have a sod exposure, and the sunshine recorder is a solid glass ball similar to that in use in other portions of Europe. Dr. C. H. Chree is the director of the Kew Observatory, and Mr. Constable is the meteorologist.

I left London on the morning of December 12 for Paris by the Newhaven-Dieppe route. While the weather was quite pleasant, before reaching Newhaven the barometer was falling rapidly, and in the afternoon had reached a minimum of about 29.50 inches, my anticipation that I would have a rough Channel passage being fulfilled. A strong southwest gale blew right across the Channel, and while the sea was probably not any more tempestuous than what I experienced in crossing the ocean, it seemed far more pronounced because of the small size of the Channel boat as compared with that of the large ocean liner. It seemed at times as if the boat would turn almost upside down; and, while I did not become seasick, there were only a few passengers that successfully withstood the ordeal. It was, in fact, a great relief to all when the harbor of Dieppe on the French coast was reached. Storm signals had been hoisted both on the English and French coasts. It was raining heavily upon our arrival at Dieppe at about 4 p. m., but by the time Paris was reached at 7 p. m. the sky had become clear and the barometer was rising steadily.

I visited the central office of the French service, called the Bureau Central Météorologique, on December 14. It is situated at Rue de l'Université 176, about 1000 feet from the Eiffel Tower. Dr. A. Angot was at that time acting director, and he has since succeeded to the position of director, relieving his father-in-law, Professor Mascart, on January 1. Doctor Angot was most kind in imparting information to me about his service. I was, of course, especially interested in the forecast feature and the instrumental equipment. The reports from Europe are received in the Paris office much the same as in London; and as the meteorological service can secure use of the telegraph wires only in the morning no night forecasts whatever are given out. There is often delay in receiving the telegrams and there is seldom more than one report received daily from Spain. The director expressed his regret at being unable to secure reports promptly from the Spanish Peninsula, as they would naturally be of great assistance to his service in forecast work. The forecasts, when forwarded each morning over the wires, are given precedence over all other business, and it is my impression that they are issued from Paris for the entire Republic.

There is some similarity between the various meteorological publications of the countries of Europe; and the daily weather map and bulletin printed by the French service is not much unlike the British publication, especially as regards the features of the tabulated bulletin. The French publication has, however, two maps—one showing the barometric pressure and its variations, together with the state of the weather, while the second shows the existing temperatures and changes during the past twenty-four hours. There is also a smaller chart issued in connection with the general summary of atmospheric conditions—a one-page publication. Twelve hundred weather maps are published daily, 125 of these being reserved for the use of the meteorological office. The maps are printed outside the office, and the balance are sent directly to subscribers thru the mail. There is no map issued in any other French city outside of Paris, and the observatories are maintained mainly by universities and municipalities. There is an additional observatory maintained in Paris itself by the municipality—the Tour Saint Jacques—it is not, however, under the jurisdiction of the Meteorological Bureau. Many of the instruments of the Paris office—such as the sunshine recorder, anemometer, anemoscope, and thermometers—are exposed on top of the Eiffel Tower, and are connected electrically with the instrument room at the central bureau. Instruments exposed at the central bureau are, of course, also in operation. The sunshine recorder in use was the glass ball. The rain and snow gages were placed on the ground in the rear of the building, in an open court, which apparently offered an excellent exposure. The Richard recording hair hygrometer was noted,

and Doctor Angot said that the record it made was highly satisfactory.

The weather in Paris on December 13 was rainy, while on the 14th there were some showers and snowsqualls, with intermittent sunshine; the temperature, however, was comparatively mild. As I journeyed eastward from Paris across the Continent of Europe, I could not help noticing the increasing cold as the interior was approached. While there was no snow visible in France, except on the distant mountains, by the time Strassburg was reached the ground was covered, and it became deeper and deeper as the route lay thru the Black Forest, and by the time Munich was reached, it seemed as if the average depth was nearly one foot.

I remained in Munich until after Christmas, and it was on December 21 that I visited the meteorological office, meeting Dr. Fritz Erk, the director. From the time of my arrival in Germany up to that date there had been no sunshine. Each day was much like the others; light snow continued falling, but the depth did not seem to increase materially. I asked Dr. Erk whether the sun ever shone in Bavaria thru the winter, and he smiled and answered that the clouds were quite low and that the sun would shine soon. His forecast was well verified, as December 22 was quite clear, but there was a quick return to cloudy weather with snow flurries on December 23, and it is my recollection that the same conditions prevailed in Munich practically during the balance of my stay. The weather was not disagreeable, however, but rather the contrary, and everything looked clean and bright under the newly fallen snow.

I was surprised to learn that there is no general meteorological service in Germany, but that each principality or kingdom has its own bureau. The central station of Bavaria is in Munich, and it is here that the forecasts for the kingdom are made. All the daily reports are received and sent out by telephone. The charts are seldom fully completed before noon and the forecasts are issued at 3 p. m. for a period of twenty-four hours. One hundred copies of the weather map are issued from the Munich office each day, and there is a small subscription price. It is a two-page publication, printed only on the inside, with the general weather chart on the left and a tabulated bulletin on the right and miscellaneous data and forecasts at the bottom. There is only one working chart used in the forecast room. A snow chart also is issued from the Munich office each week, which shows the depth of snow thruout the kingdom, special reference being given to the depth in the mountains.

The instrumental equipment is not important. The wet and dry-bulb thermometers were placed immediately outside the window on the north side, overlooking the street, in a galvanized-iron shelter, open at the bottom, which resembled at a distance the tipping-bucket rain gage used by the United States Weather Bureau. There is no arrangement provided for fanning the wet bulb when an observation is being taken. A hair hygrometer recording on a dial is in use, but the station has no hygrograph. Doctor Erk has the title of professor in the university and gives daily lectures to students on practical work. Some research work has been done with captive balloons. A display of meteorological instruments, the barometer and thermometer, was noted in three prominent places in Munich; they were not, however, the property of the meteorological service, and evidently were used as advertisements for an instrument maker, as they afforded an excellent display and attracted many people. I was impressed with the amount of interest that was taken in meteorological work there, and in several rooms of the art galleries were located wet and dry-bulb thermometers to indicate the relative humidity of the atmosphere, there being also pans containing water, connected with radiators, to maintain a certain amount of moisture.

I arrived in Vienna on the night of December 27, and the

weather was much the same here as in Bavaria. I was much impressed with this snow-clad country. There seemed to be a remarkable uniformity in its distribution. The evergreen trees were covered as well, and I could not but feel that from the interior of Europe originated the tales and pictures in regard to Santa Claus. I understand that this uniform snow covering during the winter is customary; and this is possible, as the snow usually falls without drifting—there being little wind—and is often moist and clings to the trees. Moreover the temperature continued practically the same while I was in Germany and Austria, apparently just a few degrees below freezing, there being no melting whatever.

My chief hope in visiting Vienna was to meet Dr. Julius Hann, former director of the meteorological service but now retired, and fortunately I was not disappointed. At my first call at the central office on December 29 I found it closed, the concierge informing me that it was not open after 1 p. m., except for the purpose of observations late in the afternoon. On the morning of the 30th I called again and had a most pleasant visit with Doctor Hann. I brought to him kind messages of which I was the bearer from America. The doctor expressed great pleasure in receiving me, and was much interested in the progress of meteorological science in America. Altho not actually engaged in directing the bureau in Austria, he still maintains his connection with the service and retains a room in the observatory, where he is continuing his writings. Doctor Pernter, the present director, was absent on a vacation. Doctor Hann, after according me a most pleasant reception, requested Mr. Exner, who was a visitor to the Central Office at Washington in 1905, to show me thru the meteorological office. The location of the observatory building differs much from the other observatories which I visited in Europe. Instead of being situated in the thickly settled portions of the city, as the others are, the central office at Vienna is on a prominence on the outskirts of the city, on a street called Hohe Warte, the building being quite spacious, of frame construction, and surrounded by a large lot. The Vienna office is the central station for the greater portion of Austria, but there are forecast centers at Budapest, Trieste, and Pola, the latter two being under the jurisdiction of the Minister of Marine. Forecasts are issued daily about 2 p. m., and cover the ensuing twenty-four hours. They are telegraphed over the government lines and furnished to post-offices. About a hundred weather maps are issued and are sold to subscribers at 3 kroners per month. The publication consists of two pages, a tabulated bulletin on one side and a general weather chart on the other. This chart in its construction resembles somewhat the weather maps used in the United States.

The charts used in forecast work comprise the morning working chart, a separate temperature chart, and the general chart of the previous night. Of the meteorological instruments I especially noted one which recorded the pressure of the wind. It had a diaphragm or pressure plate which was held by springs, and turned with the vane, facing the wind at all times. A glass ball sunshine recorder is in use here also. The thermometer shelter was located above the sod, but supported against the building on the north side. Exposed in the shelter are a Richard recording hair hygrometer and a Lambrecht hygrometer with an index recording on a dial, also stationary wet and dry-bulb thermometers. The soil thermometers were exposed at the station at depths of 1, 2, 3, and 4 meters, respectively, inclosed in a drainpipe. There are also a thermometer placed just below the surface of the soil, and maximum and minimum thermometers right on the surface, similar to those exposed in St. James Park in London. The electrometer and radiation thermometers are also used.

My night ride in the train thru the Venetian Alps from Vienna to the Adriatic on December 30–31 was most interesting. A heavy snowstorm had occurred in the mountains

during the previous day, and the trees and the ground were well covered with newly fallen snow. The immense evergreen trees, towering above with their white mantles in the clear moonlight, afforded a grand sight to the traveler. Altho no weather that could be considered really cold had been thus far experienced by me in Europe, the temperature, as I said before, being only a few degrees below the freezing point, yet I anticipated much warmer weather on approaching the Adriatic, and had some idea that as soon as so-called "sunny Italy" was reached summer temperatures would be experienced. On my arrival in Venice, however, the air actually felt much colder than any previously experienced on the trip. In fact, according to my own sensations, the weather at Venice was by far the coldest experienced by me during the entire winter of 1906–7, whether in America or in Europe. It is true that the minimum temperature at Venice was only a few degrees below the freezing point, but as the air was well-nigh saturated with moisture from the Adriatic and the innumerable canals, the feeling was of that damp chill which penetrated almost the very bones. There was even a little snow in patches on the ground, but the uniform snow covering was not observed in any place after having passed south of the Venetian Alps. I had been advised by friends that I might have constant use for an umbrella in Italy, as my visit was apparently timed with the rainy season, but a slight mist that occurred on the morning of January 2, while I was en route from Venice to Genoa, was the only wet weather that I experienced during a period of nearly three weeks in Italy.

The meteorological station in Venice is on the Lido, and is under the jurisdiction, I understand, of the marine service. The observatory can be plainly seen across the Grand Canal. Thru lack of time I did not visit the observatories either here or in Genoa, as I expected to devote considerable time to the central bureau in Rome. By the time of my arrival on the other side of the Italian Peninsula at Genoa the temperature had risen to a marked degree, the air being quite balmy. Going farther south to Florence a day later the air was rather chilly, but still quite pleasant in the daytime, except that a strong wind was blowing constantly down the valley of the Arno. This was said by the residents to be quite an unusual occurrence. During the remainder of my stay in Italy the weather was well nigh perfect, "sunny Italy" being at its best.

I was able to spend a week in Rome. On the afternoon of January 11 I had a pleasant visit with the Rev. Father Hagen, S. J., director of the Vatican Astronomical Observatory, and former director of the Georgetown University Observatory, near Washington, D. C. The former summer residence of Pope Leo XIII, located in the center of the Vatican garden, is being made into a new observatory. It is not expected that any meteorological work will be carried on here, except what is required in connection with the astronomical work.

The entire day of January 12 was practically given over to a visit to the central meteorological office located in the building of the Collegio Romano near the Corso. I went to the bureau in the morning, believing that Dr. L. Palazzo, the director, could speak English, having been thus advised on the previous day, and I consequently made no provision for an interpreter. I found, however, that my informant was mistaken, but the director soon found a common ground upon which we could meet. He immediately suggested that I write what I desired to say in English and he would write in French. Altho this was somewhat slow, we got along very well for something like an hour and a half, having no difficulty whatever in reading each other's messages. I desired, however, to go into matters in greater detail than was possible under the limitations referred to, and at Doctor Palazzo's invitation I called again in the afternoon provided with an interpreter, and was shown over the entire bureau by the director. The central bureau has no observatory of its own in Rome. In

fact, the meteorological observatories thruout Italy are not strictly a part of the meteorological service. There is a meteorological observatory in the building of the Collegio Romano, where the central bureau is located, but the observatory is merely a part of the astronomical observatory of the Collegio Romano, and has a director who is a professor in the institution. There is also a meteorological observatory on the Capitoline Hill, which is, I understand, maintained by the municipality of Rome. Observatories similar to these are scattered thruout Italy, and report their observations to the central bureau thru an arrangement with either their institution or municipality.

In the forecast room a general working chart and supplementary temperature and pressure charts are used, as well as a chart showing the general conditions of the previous evening. The telegraphic reports are not received completely until about noon, and the forecasts are issued about 2 p. m. for all Italy, for the ensuing twenty-four hours. The printed daily publications embrace tabulated bulletins and weather maps quite similar to those issued in other European meteorological offices. The subscription price in Italy is 16 francs per year.

There seemed to be nothing special to note in connection with the instrumental equipment of the meteorological observatory visited. The recording hair hygrometer was found in use here also, but Doctor Palazzo said it was not giving satisfaction, contrary to the opinion received in other places. The wet and dry-bulb thermometers in the shelter were located on the roof on a stationary standard, but a fan was placed near the bulbs so that when a spring was wound up the air was set in motion, the effect being quite similar to that secured by our whirling apparatus. There is a large number of small stations in Italy where research work is being done, and special attention is now being given to the meteorological conditions in the tobacco fields. One of the divisions of the central bureau, directly under Professor Morti, has charge of the observations of earthquakes.

I had been informed by many during my visit that the winter was the coldest experienced during the past twenty-five years, and I was interested to learn what a comparison with the actual record would show; but I was not surprised to learn from Doctor Palazzo that the winter was very nearly normal. I have frequently been impressed, in my own experience, with the fact that people forget easily about the past, especially when weather is concerned, and I was rather interested in finding the same conditions obtaining abroad.

My trip from Naples to Mount Vesuvius on January 14 was made partly with the hope of visiting the observatory after my descent from the crater, but as I reached the funicular railway station, near which the observatory is located, I found my train, the last of the day, was about to start on the return trip, and I had but a passing glimpse of a Robinson anemometer and a thermometer shelter on the outside of this far-famed observatory.

In my traveling southward thru Italy I was much impressed with the increasing barometric pressure, and during my stay at Naples the barometer was uniformly at 30.5 inches. Sailing from that port on January 16 westward to Gibraltar there was practically no change in the reading of the barometer, and the weather continued much the same as in Italy. After passing by the "big rock" out into the Atlantic, bound for New York, I naturally expected the ship to turn in the direction of the port of destination. The course, however, lay to the south of west until the parallel of 35° was reached at 22° west longitude, passing about 300 miles south of the Azores. The course was thence directly west along this parallel as far as 60° west longitude, when it was changed to the northwest toward New York. This is the regular course of the Mediterranean fleet, and masters are required by the regulations of their companies to follow it during the winter season, as it lies

along the permanent "high" where storms are infrequent. In fact the winds were light and gentle during the greater part of this trip across the ocean, and the weather was quite summerlike, until the course turned to the northwestward across the Gulf Stream. This was in strong contrast with the stormy weather experienced on the northern route on my voyage eastward. During the summer season, however, when storms are infrequent, the sailing course of these vessels from Gibraltar is nearly in a direct line passing north of the Azores. New York was reached on January 31, 1907.

A BENEFICENT SCIENTIFIC MISSION.

The Syrian Protestant College at Beirut was founded in 1863 and opened in 1866, thru the efforts of North American Presbyterian missions. Complete courses are given in commerce, medicine, and biblical archaeology. Formerly the Arabic language was used, but now English is used, and many Beirut students have wandered over to the United States. Among the faculty are Rev. George E. Post, of New York, the professor of surgery; Dr. A. E. Day, of natural sciences, and Robert H. West, of mathematics and astronomy.

The Lee Observatory was founded in the year 1874 for special astronomical studies. The meteorological record began in June, 1874. The record is maintained by the students and assistants, of which there is a large number, under the especial oversight of the director. The officials responsible for this series are therefore as follows: 1874-1882, Rev. C. V. A. Van Dyck; 1882-1884, Dr. Jaris Nime; 1884-1899, Prof. Robert H. West; 1899 to date, Raymond S. Dugan. The observatory is on a high, rocky ridge that extends toward the north and northwest, above the sea. It is in latitude $33^{\circ} 54' 20''$ N., and longitude $35^{\circ} 28' 10''$ E. The cistern of the barometer is at present 35 meters above sea level. This series of observations, now continued for over thirty years, is the longest and most important in any portion of the Turkish dominion. From the beginning observations have been made three times a day, originally at 9 a. m., 3 and 9 p. m., but now at 8:30 a. m., 2:30 and 8:30 p. m. Since February, 1894, a Richard barograph has been in operation, and from some earlier date a Richard thermograph also. The observations have been published quite regularly in the annual volume of the Central Institute of Austria. The data for Beirut and Jerusalem afford almost the only basis we have for a statistical study of the climate of Palestine, and it is proper to say that we still need additional observatories in that region, especially a station on the summit of Mount Carmel, which is only 1400 feet above sea level (latitude $32^{\circ} 51' 10''$ N., longitude $34^{\circ} 58' 10''$ E.), and is easily made habitable.

May we not hope that all medical and educational missions will do as much for science as is anyway practicable. Especially may all missions imitate the example of the Jesuits in the Philippine Islands, where a great system for the study of climatology and for forecasting storms has been established by them. Such general applications of science contribute to the material progress and welfare, and hence to the intellectual and religious development of a nation, quite as much as any other form of activity. In modern times the first departure from a purely theological or religious mission was the establishment of medical missions, of which we have notable examples in the work of Dr. Peter Parker, at Canton, and George E. Post, at Beirut. Whatever missions can do for the intellectual and physical welfare of the nations is a truly noble work, and we must look upon a well organized weather bureau as most beneficent in all its relations to the people.

INTERCONVERSION OF CENTIGRADE AND FAHRENHEIT DEGREES.

As many American and English meteorologists find difficulty in thinking in the centigrade system, we call attention to